

WHAT IS CLAIMED IS:

1. An image displaying projector for producing and projecting an optical image, comprising:

a lamp for emitting a light for image projection;

a light tunnel having a tubular portion and two openings provided at both ends, which receives the light from the lamp at one end opening of the tubular portion, and guides the light as it reflects on an inner side of the tubular portion, and releases it from the other end opening of the tubular portion; and

an imaging device for producing an optical image by means of the light released from the light tunnel, wherein

the light tunnel is made of a thin metal sheet folded to shape the tubular portion which has two openings provided at both ends.

2. An image displaying projector according to claim 1, wherein the tubular portion of the light tunnel is configured by bending a thin metal sheet.

3. An image displaying projector according to claim 1, wherein the tubular portion of the light tunnel has an inner side being processed with a reflective mirror coating.

4. An image displaying projector according to claim 1, further comprising an image projection engine body arranged to support the light tunnel and the imaging device, wherein

the light tunnel has a mounting portion thereof provided for mounting the light tunnel to the image projection engine body, the mounting portion being configured integral with the thin metal sheet of the tubular

portion.

5. An image displaying projector according to claim 4, wherein the image projection engine body has positioning projections or recesses provided therein for determining the position of the light tunnel and screw holes provided therein for accepting retainer screws to retain the light tunnel, and

the mounting portion of the light tunnel has positioning apertures or projections for engagement with the corresponding positioning projections or recesses of the image projection engine body and screw holes provided therein to align with the screw holes in the image projection engine body for accepting the retainer screws.

6. An image displaying projector according to claim 1, further comprising a corrective lens for correcting the effect due to the light wavelengths released from the light tunnel, wherein

the light tunnel has a lens holder for holding the corrective lens, the lens holder being configured integral with the thin metal sheet of the tubular portion.

7. An image displaying projector according to claim 6, wherein the image projection engine body has a lens holding portion for accepting the lower half of the corrective lens, and

the lens holder of the light tunnel is shaped to match with the upper half of the corrective lens and extend continuously with elasticity from the tubular portion for holding down the corrective lens fitted in the lens holding portion of the image projection engine body.

8. An image displaying projector according to claim 1, wherein the

light tunnel has an angle adjusting portion for adjusting the angle at which the light tunnel is mounted to the image projection engine body, the angle adjusting portion being configured integral with the thin metal sheet of the tubular portion.

9. An image displaying projector according to claim 8, wherein

the image projection engine body has a tunnel inserting portion into which the light tunnel is inserted in substantially a horizontal direction, the tunnel inserting portion including an input end holder for holding the tubular portion close to a light inputting end opening of the light tunnel and an output end holder for holding the tubular portion close to a light outputting end opening of the light tunnel,

the angle adjusting portion has retainer springs provided close to the light inputting end opening of the tubular portion for pressing against an upper inner wall and a lower inner wall of the input end holder and flexible springs provided close to the light outputting end opening of the tubular portion for pressing against an inner sides of the output end holder,

the retainer springs are made of upper and lower portions bent outwardly at the light inputting end opening of the tubular portion of the thin metal sheet and have positioning projections for determining the position of the light inputting end opening of the tubular portion,

the input end holder has positioning apertures provided in the upper and lower sides of the input end holder for engagement with the positioning projections of the retainer springs,

the flexible springs made of an upper portion and either a left or right portion bent outwardly at the light outputting end opening of the

tubular portion of the thin metal sheet, and

the output end holder has angle adjusting screw holes provided in the lower side and the left or right side thereof into which angle adjusting screws are threaded to press against the flexible springs for determining the angle of the light tunnel.

10. A light tunnel structure in an image displaying projector for producing an optical image by means of the light guided therein through the tunnel from a lamp on an imaging device, wherein the light tunnel has a tubular portion and two openings provided at both ends, which receives the light from the lamp at one end opening thereof, and guides the light as it reflects on an inner side of the tubular portion, and releases it from the other end opening of the tubular portion, wherein

the tubular portion is made of a thin metal sheet bend to a tubular form.

11. A light tunnel structure in an image displaying projector according to claim 10, wherein the tubular portion of the light tunnel is configured by bending a thin metal sheet.

12. A light tunnel structure in an image displaying projector according to claim 10, wherein the tubular portion of the light tunnel an inner side being processed with a reflective mirror coating.

13. A light tunnel structure in an image displaying projector according to claim 10, further comprising an image projection engine body arranged to support the light tunnel and the imaging device, wherein

the light tunnel has a mounting portion thereof provided for mounting the light tunnel to the image projection engine body, the mounting

portion being configured integral with the thin metal sheet of the tubular portion.

14. A light tunnel structure in an image displaying projector according to claim 13, wherein

the image projection engine body has positioning projections or recesses provided therein for determining the position of the light tunnel and screw holes provided therein for accepting retainer screws to retain the light tunnel, and

the mounting portion of the light tunnel has positioning apertures or projections for engagement with the corresponding positioning projections or recesses of the image projection engine body and screw holes provided therein to align with the screw holes in the image projection engine body for accepting the retainer screws.

15. A light tunnel structure in an image displaying projector according to claim 10, further comprising a corrective lens for correcting the effect due to the light wavelengths released from the light tunnel, wherein

the light tunnel has a lens holder for holding the corrective lens, the lens holder being configured integral with the thin metal sheet of the tubular portion.

16. A light tunnel structure in an image displaying projector according to claim 15, wherein

the image projection engine body has a lens holding portion for accepting the lower half of the corrective lens, and

the lens holder of the light tunnel is shaped to match with the upper half of the corrective lens and extend continuously with elasticity from the

tubular portion for holding down the corrective lens fitted in the lens holding portion of the image projection engine body.

17. A light tunnel structure in an image displaying projector according to claim 10, wherein the light tunnel has an angle adjusting portion for adjusting the angle at which the light tunnel is mounted to the image projection engine body, the angle adjusting portion being configured integral with the thin metal sheet of the tubular portion.